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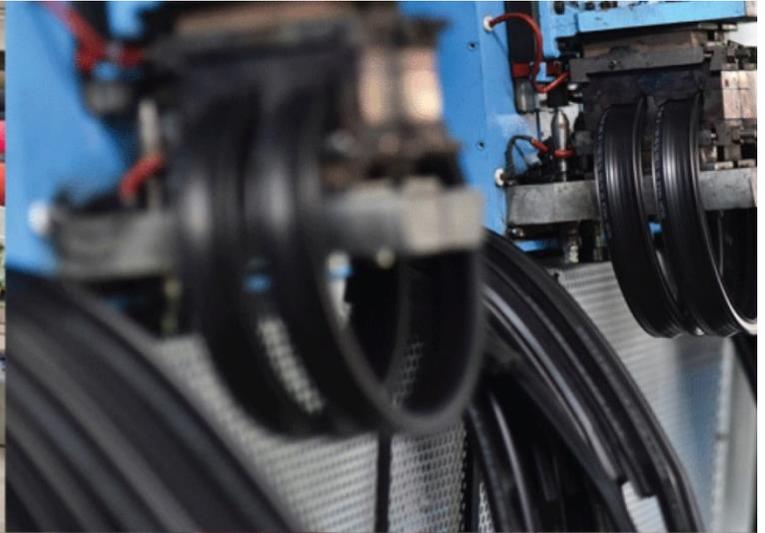


ELECTRO MAGNETIC innovative technologies

Kerone Research & Development Centre (KRDC)

B/47, Addl. MIDC. Anand Nagar, Ambarnath (East), Thane- 421 506, India

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**Batch Microwave Heat Treatment  
for Rubber Preheating**



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Customer :	M/s. Premier Seals (I) Pvt. Ltd., Pune
Process :	Batch Microwave Heat Treatment for Rubber Preheating

**TEST REPORT No: 47/KRDC/LAB/17 Mum 01/10/2018**

Date Sample reception : 01/10/2018

ID : 47/LAB/61

**SAMPLE DESCRIPTION:**

Sampling : As Requested

Sample Condition : Acceptable

Quantity : 3 bags

Sampling date : 15/11/2018

Product : Natural Rubber

Requirement : Rubber Preheating (Temperature of core of product after treatment must be range between 60-70°C)

Start Date test : 15/11/2018

End Date test : 15/11/2018

**EXPERIMENTAL SET UP:**

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**BATCH MICROWAVE HEATING SYSTEM SPECIFICATIONS:**

<b>Microwave Power</b>	1.45 kW
<b>Frequency</b>	2450 MHz $\pm$ 50
<b>Convective Power</b>	1.5 kW
<b>Microwave Exposure Zone (cavity)</b>	500*350*350 mm <sup>3</sup>
<b>Exhaust Power</b>	0.5 HP

**ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:**

<b>Temperature (degree C)</b>	27.8°C ( $\pm$ 5°C)
<b>Humidity (%)</b>	$\leq$ 63% RH
<b>Pressure (kN/m<sup>2</sup> or kPa)</b>	Not recorded

**Note for recommendation:** Environmental conditions have a direct impact on test results. Accuracy and consistency of test data are affected by the laboratory conditions

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The value obtained is already corrected for possible recover value stated, if applicable. This document may not be reproduced or disclosed wholly or partly in any part thereof without the written consent of the laboratory management or customer. This document relates only to the specimen samples processed. The processed sample will be kept in this laboratory for 7 days from the date of heat treatment.



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**EQUIPMENTS USED:**

Name of Equipment	Picture of Equipment	Specifications
Digital Thermometer with sensor		Model No: TM-902C Temperature range: -50~750°C Temperature accuracy: $\pm 1^\circ\text{C}$
Thermo Hygrometer		Model No: HTC-2 Temperature accuracy: $\pm 1^\circ\text{C}$ (1.8°F) Temperature resolution: 0.1°C (0.2°F) Humidity range: 10%~99% RH Humidity accuracy: $\pm 5\%$ RH Humidity resolution: 1% RH

**SAMPLE PREPARATION AND METHOD/PROCEDURE:**

The experiment has been performed on given of rubber slabs having same shape and size in batch microwave heating system for rubber preheating. For this, rubber slabs has been placed on turntable in microwave system and heating treatment has been given for various parameters. The inner core temperature of samples has been noted.



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**ANALYTICAL RESULTS:**

	<b>Trial (samples placed vertically)</b>
<b>No. of samples</b>	<b>12</b>
<b>Microwave Power Gain (%)</b>	<b>84</b>
<b>Chamber Temperature (°C)</b>	<b>70</b>
<b>Hot Air Temperature (°C)</b>	<b>60</b>
<b>Heating Cycle Time (minutes)</b>	<b>3</b>
<b>Microwave Current (A)</b>	<b>7</b>
<b>Surface Temperature (°C)</b>	<b>45-50</b>
<b>Core Temperature (°C)</b>	<b>60-75</b>

**PICTURES DURING TRIALS:****Format: F/R&D/01**

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### OBSERVATIONS:

By the physical observation, it has been found that preheating of natural rubber, which is having low elastic properties, when exposed to microwave radiation, it get more resilience and elasticity. The requirement of core temperature between 60-70°C has been successfully achieved.

*K Komal*

Miss Komal Bhoite

Tested By